# Complete Summary

## GUIDELINE TITLE

American Association of Clinical Endocrinologists medical guidelines for clinical practice for the diagnosis and treatment of acromegaly.

## BIBLIOGRAPHIC SOURCE(S)

Cook DM. AACE medical guidelines for clinical practice for the diagnosis and treatment of acromegaly. Endocr Pract 2004 May-Jun;10(3):213-25. [73 references] PubMed

## GUIDELINE STATUS

This is the current release of the guideline.

## COMPLETE SUMMARY CONTENT



## SCOPE

### DISEASE/CONDITION(S)

Acromegaly

### GUIDELINE CATEGORY

Diagnosis
Evaluation
Management
Treatment

### CLINICAL SPECIALTY

Endocrinology
Family Practice
Internal Medicine
Surgery

### INTENDED USERS

Physicians

### GUIDELINE OBJECTIVE(S)

To assist health-care professionals in medical decision making related to the diagnosis and treatment of acromegaly

### TARGET POPULATION

Patients with suspected or confirmed acromegaly

### INTERVENTIONS AND PRACTICES CONSIDERED

#### Diagnosis/Evaluation

1. Assessment of clinical signs and symptoms of acromegaly
2. Laboratory measurement of serum levels of insulin-like growth factor-I (IGF-I), growth hormone (GH), growth hormone-releasing hormone (GHRH)

#### Management/Treatment

1. Pituitary surgical therapy (translabial, transnasal)
2. Pharmacologic therapy (somatostatin analogues [octreotide; octreotide long-acting release (LAR), lanreotide, lanreotide autogel]; growth hormone receptor antagonists [pegvisomant]; dopamine agonists [cabergoline])
3. Pituitary radiation therapy (conventional; proton beam; Linac; gamma knife)
4. Monitoring and treating comorbidities

### MAJOR OUTCOMES CONSIDERED

- Sensitivities and specificities of tests used to diagnose acromegaly
- Growth hormone (GH) and insulin-like growth factor-I (IGF-I) levels
- Morbidity and mortality related to acromegaly
- Clinical remission
- Tumor recurrence
- Side effects and adverse effects of treatment

## METHODOLOGY

### METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases

### DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Not stated

### NUMBER OF SOURCE DOCUMENTS

Not stated

### METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Not stated

### RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Not applicable

### METHODS USED TO ANALYZE THE EVIDENCE

Review

### DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

### METHODS USED TO FORMULATE THE RECOMMENDATIONS

Not stated

### RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Not applicable

### COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

### METHOD OF GUIDELINE VALIDATION

Peer Review

### DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Not stated

## RECOMMENDATIONS

### MAJOR RECOMMENDATIONS

## Diagnosis

The diagnosis of acromegaly is optimally based on both clinical and biochemical evidence. Even in the mildest cases of acromegaly, subtle body changes can usually be detected, especially enlargement of the hands and feet.

Once acromegaly is suspected, measurement of serum insulin-like growth factor-I (IGF-I) should be the next step. Acromegaly in the absence of high IGF-I levels is extremely rare; therefore, this relationship makes IGF-I an ideal screening test. IGF-I is also useful for monitoring of treatment outcomes, such as after a surgical procedure or during treatment with octreotide or pegvisomant.

Growth hormone (GH) is produced by the pituitary gland in a pulsatile fashion, with the highest levels produced during sleep in concert with sleep stages. Normal subjects have very low levels of GH throughout much of the day. In patients with acromegaly, increased pulse frequency results in high levels of GH. These GH levels may demonstrate considerable variability, ranging from 1 ng/mL to values in excess of 100 ng/mL. With both extremes, GH concentrations are sustained, without declining to the low concentrations between pulses seen in normal subjects. This sustained elevation of GH levels is presumably the cause of signs and symptoms of acromegaly. Sometimes IGF-I levels may remain high even in the presence of sustained low serum concentrations of GH. Indeed, up to a third of the patients with acromegaly who undergo surgical treatment may demonstrate a persistently high IGF-I level despite a nadir GH level of less than 1 ng/mL during an oral glucose tolerance test (OGTT). This finding indicates that a proportion of patients may continue to experience subtle changes in GH secretion, leading to persistent disease.

Measuring GH during an OGTT has been a standard technique for diagnosis of acromegaly for almost 40 years. The nadir GH level that supports the diagnosis has been in flux throughout that time and remains so because of the increasing sensitivity of GH assays and the improvement of IGF-I assays to corroborate the diagnosis. This test is performed by giving 75 g of glucose orally and sampling for glucose and GH levels at 0, 30, 60, 90, and 120 minutes after administration of the glucose. If the GH level does not decline to below 1 ng/mL during the test, the patient has acromegaly. This diagnosis must be made in conjunction with the clinical picture and assessment of the serum IGF-I. Recent studies have shown that occasional patients have GH levels as low as 37 pg/mL and still have signs and symptoms of acromegaly and high levels of IGF-I.

Low, but nonsuppressible, levels of GH after oral administration of glucose (GH >1 ng/mL) are frequently noted in patients who have undergone surgical treatment and who have normal IGF-I concentrations. In such patients, the acromegaly is considered controlled but not cured. If the patient is asymptomatic, close follow-up without therapy is reasonable. Currently, prophylactic irradiation is not considered warranted in this context. If symptoms such as heat intolerance or glucose intolerance emerge, or if the IGF-I level becomes high, further therapy is warranted.

Although random GH levels are not generally useful in diagnosing acromegaly, they may have to be used under certain circumstances. Patients with diabetes mellitus have GH levels that respond to glucose; however, performance of an oral

glucose tolerance test in patients with very high levels of glucose is not always advisable. Some neuroendocrinologists order 24-hour GH sampling, but that approach is usually part of a defined research project. Thyrotropin-releasing hormone and growth hormone-releasing hormone (GHRH) stimulation tests yield discordant GH responses in up to 50% of patients with acromegaly. Thus, these tests are rarely useful in helping to diagnose acromegaly.

Measurement of growth hormone-releasing hormone can be helpful in detecting an ectopic source of the acromegaly. A growth hormone-releasing hormone test should be done when a patient has no obvious pituitary tumor, but there is proven acromegaly. Rarely, acromegaly can be part of a genetic syndrome, including multiple endocrine neoplasia type 1 (MEN 1), McCune-Albright syndrome, familial acromegaly, and Carney complex.

## Role of Surgical Therapy

### Goals of Operative Intervention

Surgical therapy for acromegaly has the following goals:

1. Normalization of GH secretion and IGF-I levels
2. Elimination of mass effect and reversal of associated neurologic problems—for example, optic compression and headaches
3. Alleviation of comorbidities associated with active acromegaly, including sleep apnea, cardiomyopathy, hypertension, and arthritis
4. Preservation of pituitary function and restoration of any endocrine deficits caused by the tumor
5. Prevention of recurrence of the tumor
6. Procurement of tissue for pathologic and scientific analysis

Refer to "Benefits" and "Harms" fields for Advantages and Disadvantages of Surgical Treatment.

### Prognostic Factors

Careful review of a series of patients treated surgically for acromegaly has revealed several factors that predict a satisfactory outcome. Clearly, the smaller the tumor, the more likely is the possibility of remission, and small non-invasive tumors (microadenomas) are the most favorable category of tumor for surgical remission. Moreover, the basal GH level before surgical treatment predicts the outcome, with favorable results occurring in those patients with basal GH levels of less than 45 ng/mL.

One of the most important factors favoring good outcome is the experience of the surgeon and the surgical team. Studies have shown that surgeons who are actively involved on a regular basis in performance of pituitary surgical procedures achieve better outcomes.

The criteria for a qualified pituitary surgeon should include the following:

1. Prior experience with more than 100 pituitary operations

2. An ongoing experience with more than 20 pituitary cases per year
3. Involvement in a team approach with colleagues from other specialties, especially endocrinology, neuropathology, and radiation oncology

## Candidates for Surgical Treatment

Surgical treatment should be considered the first therapeutic option in every patient with acromegaly. Medical therapy may be offered as first-line treatment but only after the surgical option has been discussed with the patient. Those patients who present with severe mass effect manifested as visual loss or double vision are appropriate candidates for urgent surgical treatment. Because the rapidity, reliability, and extent of shrinkage of GH-secreting pituitary adenomas by pharmacologic agents are not entirely predictable, presurgical treatment with somatostatin analogues should not postpone surgical intervention in urgent cases. Because the GH-lowering effects of somatostatin analogues seem to be, in part, a function of the initial GH level, surgically lowering the GH level may improve the possibility of pharmacologic control, even in those patients who cannot be surgically "cured."

Some patients are unsuitable candidates for surgical treatment and should be considered for medical therapy as first-line management. These selected patients include those with medically unstable conditions, those at high risk for complications of anesthesia because of airway difficulties, and those with major systemic manifestations of acromegaly, including cardiomyopathy, severe hypertension, and uncontrolled diabetes. Some of these patients become more suitable candidates for surgical intervention after pretreatment with pharmacologic agents, and this type of preoperative management has the potential for lowering risks and improving outcomes in patients ultimately treated surgically.

## Technical Advances

Certain technical advances have helped improve the outcome of surgical management of acromegaly. Many strides have been made in the area of instrumentation, such as the latest generation of operating microscopes with excellent optics that improve visualization and the operating endoscope that lends versatility and facilitates minimally invasive procedures. Other technical innovations that have improved surgical management include advances in image guidance and navigation. The preoperative characterization of pituitary tumors can be exquisitely done with use of high-resolution magnetic resonance imaging (MRI). Furthermore, various computer-based navigational systems will allow real-time tracking of the operative procedure on MRI or computed tomographic images obtained preoperatively—a technique that is extremely helpful in patients who have undergone a prior surgical procedure and in whom important anatomic landmarks may now be obscured. The use of intraoperative magnetic resonance imaging is another relatively new method that allows the surgeon to have imaging control throughout the entire operative procedure and offers the combination of navigational capabilities with intraoperative imaging to aid in determining the extent of resection.

For standard pituitary surgical procedures, the translabial or the transnasal approach can be used. The transnasal approach is a recent development, which

may be the procedure of choice with smaller pituitary tumors for surgeons experienced with this technique. The advantages and disadvantages of these two approaches are summarized below.

| Comparison of Approaches for Standard Pituitary Surgical Procedures | | |
|---|---|---|
| Approach | Advantages | Disadvantages |
| Translabial | Improved visibility | More invasive<br><br>Potential injuries of teeth and mouth |
| Transnasal | Less discomfort<br><br>Less invasive | Limited visibility<br><br>Poorer control of hemostasis |

Summary

Surgical treatment remains the first management option for virtually all patients with acromegaly. Medical therapy may be selected as first-line treatment in patients who refuse to undergo or are too ill to undergo a surgical procedure or who prefer the medical option over an operation. An experienced pituitary surgeon should be selected whenever possible, so that the need for reoperations can be minimized.

Role of Medical Therapy

During the past decade, major progress has been seen in the development of highly specific and selective pharmacologic agents, which have considerably facilitated aggressive management of patients with persistently active acromegaly. Refer to the original guideline document for a summary of current evidence for each of the major classes of pharmacotherapeutic agents with special emphasis on their recognized benefits and risks.

| Comparison of Various Drugs for Treatment of Acromegaly | | |
|---|---|---|
| Drug type and agents | Monitoring suggestions | Preferred indication |
| Dopamine agonist (Cabergoline) | Growth hormone (GH), insulin-like growth factor-I (IGF-I) | GH and prolactin cosecreting tumors |
| Somatostatin analogues (Octreotide; Octreotide long-acting release [LAR]; Lanreotide; Lanreotide Autogel) | GH, IGF-I, ultrasonography of gallbladder (if symptoms) | Somatostatin analogue-responsive tumor |
| GH antagonist (Pegvisomant) | Liver function tests monthly for 6 mo, then every 6 mo; magnetic resonance imaging (MRI) yearly; IGF-I only (not GH) | High IGF-I levels not responsive to somatostatin analogue therapy |

## Role of Radiation Therapy

Pituitary irradiation is most commonly used as adjunctive therapy after surgical resection of as much of the adenoma as possible. The fact that up to 80% of patients at the time of diagnosis of acromegaly have a large tumor with dural, bone, or cavernous sinus invasion (or involvement of some combination of these three) indicates that multimodality therapy will be necessary for achievement of clinical remission and a normal serum IGF-I concentration. Conventional fractionated radiation therapy may take 10 to 20 years to be fully effective and has traditionally been used in an attempt to achieve control of tumor growth and ultimate biochemical remission.

More recently, focused methods of delivering a high radiation dose to the residual pituitary tumor have been used; these delivery systems include the gamma knife, proton beam, and Linac (linear accelerator). No direct comparisons of the results among these methods of pituitary radiation delivery are available, but reports suggest that focused radiotherapy yields biochemical remission earlier than does conventional fractionated radiotherapy.

Comparison of Advantages and Disadvantages of Various types of Pituitary Radiation Therapy

| Type of radiation therapy | Advantages | Disadvantages |
|---|---|---|
| Conventional | Can be used when tumor is near the optic chiasm | 25 to 30 therapy visits<br>Delayed remission |
| Proton beam (stereotactic) | Single session or fractionated | Limited availability<br>Tumor must be >5mm from optic chiasm<br>No data on time of remission |
| Linac (stereotactic) | Single session or fractionated | Limited availability<br>Tumor must be >5mm from optic chiasm<br>No data on time of remission |
| Gamma knife (stereotactic) | Single session<br>Early remission | Limited availability<br>Tumor must be >5 mm from optic chiasm |

## Candidates for Radiation Treatment

Which patients should receive radiation therapy? In light of the delay in effectiveness, pituitary irradiation is not usually administered as the initial therapy. Patients who have residual GH hypersecretion after surgical treatment are candidates for pituitary irradiation. A combined program of medical therapy to control GH and IGF-I production while the effects of irradiation are awaited is the most logical and beneficial for the patient. Medical therapy should be withdrawn every 6 to 12 months for evaluation of endogenous GH secretion (serum IGF-I and OGTT) and development of any new pituitary hormone deficiencies.

Which patients are not suitable candidates for pituitary irradiation? Essentially all patients qualify, but the method of radiation delivery is determined by the volume and site of the residual pituitary tumor. As a general guideline, stereotactic, focused radiation methods are used only if the distance between the residual tumor and the optic chiasm or an optic nerve is more than 5 mm, because of the potential for damage to vision. Although medical therapies (somatostatin analogues, a GH receptor antagonist, and, rarely, a dopamine agonist) may lower serum IGF-I levels to normal, they are not definitive treatments for permanent control of GH hypersecretion. A specific consideration is the issue of fertility. In young adults who desire fertility, the patients (men and women) must be informed that any type of pituitary irradiation may impair gonadotropin function. Although fertility is possible with administration of exogenous gonadotropin, this technique is expensive, may require several months of treatment, and is not always successful.

### Types of Radiation Treatment

Which type of radiation therapy should be recommended? No direct comparisons of results among the various modes of radiation delivery (conventional versus different types of focused, stereotactic delivery) have been published. Reports of efficacy and complications are available, however, and they suggest that stereotactic, focused methods of delivery (gamma knife) result in remission earlier than does conventional fractionated radiation therapy. As noted, not all patients are candidates for stereotactic radiotherapy because of the concern about radiation exposure to the optic apparatus. Most available reports of the efficacy of conventional fractionated radio-therapy did not use current criteria to define remission (normal age-adjusted serum IGF-I levels and serum GH level less than 1 ng/mL after oral administration of glucose). In older studies, a "successful" response was considered a serum GH level of less than 10 ng/mL or less than 5 ng/mL. These criteria are no longer acceptable because of the availability of more sensitive GH assays, the reliability of serum IGF-I as an overall indicator of GH secretion, and the current knowledge about the importance of reducing GH and IGF-I values to normal levels to decrease the risk of premature mortality.

Refer to "Harms" field for potential complications of pituitary irradiation.

### Prevention of Tumor Recurrence

Should pituitary irradiation be given to prevent recurrence of acromegaly? A risk of pituitary tumor recurrence always exists, regardless of the type of adenoma. The reported recurrence rate in patients with acromegaly ranges from 2 to 14%. With this low risk of recurrence, no precedent is available for recommending prophylactic irradiation for the patient who has undergone successful surgical treatment and who has a normal serum IGF-I level. Every patient, however, should be scheduled for regular follow-up examinations every 6 to 12 months, for detection of any recurrence and implementation of prompt treatment, if necessary.

### Summary

Pituitary irradiation for residual GH hypersecretion is an important part of the treatment of acromegaly and should be used as an adjunctive therapy in

conjunction with medical treatment to control the disease. Development of pituitary deficiency should be anticipated and treated accordingly.

Monitoring and Treating Comorbidities

The morbidities associated with GH-secreting pituitary adenomas are due to local mass effects of the tumor, sequelae of GH and IGF-I excess, and sequelae of other pituitary hormone deficiencies. In an effort to decrease the excess mortality attributable to cardiovascular disease, respiratory disease, and cancer, aggressive modification of risk factors and screening for early diagnosis should be implemented.

Skeletal and Dental Manifestations

Unlike the soft tissue changes, the bone enlargement that occurs with excess secretion of GH is not readily reversible with successful treatment. Any corrective surgical procedure, such as maxillofacial correction of dental malocclusion, should be postponed until GH and IGF-I levels normalize or stabilize. Joint discomfort and carpal tunnel syndrome may, in part, be due to enlargement of soft tissues and retention of fluid. This component of acromegaly often improves with reduction of excess GH secretion. Established degenerative arthritis, however, if present, is irreversible and should be managed appropriately with physical therapy, anti-inflammatory medications, and surgical joint replacement, as indicated. Patients should also be screened (with bone densitometry and determination of serum calcium levels) for coexisting metabolic bone disease. If osteoporosis is present and bone densitometry findings do not improve with correction of any associated hypogonadism or hypercalciuria, antiresorptive therapy should be considered. Hypercalcemia and hypercalciuria can occur with GH excess and are due to altered vitamin D metabolism. These abnormalities should diminish with successful treatment. If hypercalcemia persists, further evaluation for primary hyperparathyroidism and multiple endocrine neoplasia type 1 (MEN 1) syndrome should be undertaken.

Hypopituitarism

In patients with acromegaly, the time frame and the possibility of developing hypopituitarism depend on the treatment used. Pituitary insufficiency that manifests preoperatively from tumor compression of the normal gland may diminish with successful surgical debulking. Alternatively, new hormonal deficits may occur as a result of the surgical procedure. The integrity of the hypothalamic-pituitary-adrenal axis and posterior pituitary function should be assessed during the immediate postoperative period. The integrity of the thyroid and gonadal axes is assessed 6 to 12 weeks postoperatively. Occasionally, dynamic testing will be necessary to determine partial deficiencies. Patients who have received radiation therapy need lifelong monitoring of pituitary function, inasmuch as new deficits can occur up to 15 years or more after radiation treatment.

Respiratory Disorders

Successful treatment of acromegaly, with reduction in the size of soft tissues of the upper airway, may improve or eliminate sleep apnea; however, many patients with acromegaly who have sleep apnea have not only a central component but

also an obstructive component. Home overnight oximetry can be used as a screening test for sleep apnea, and if abnormal results are found, formal overnight polysomnography should be performed.

Patients with acromegaly should be considered to have higher than normal risk for pulmonary infections because of the high prevalence of obstructive pulmonary disease and increased respiratory mortality in such patients. Vaccinations for influenza and pneumococcal pneumonia should be given, as recommended by the Centers for Disease Control and Prevention, for persons with medical indications—that is, annual influenza vaccine and one-time pneumococcal vaccine, with revaccination after age 65 years if more than 5 years have elapsed since the initial vaccination. For those patients who use tobacco, aggressive intervention for cessation of tobacco use should also be initiated.

### Cardiovascular Disease and Cardiovascular Risk Factors

Standard therapy for patients with left ventricular (LV) hypertrophy, impaired cardiac systolic and diastolic function, arrhythmias, conduction abnormalities, valvular heart disease, and ischemic heart disease should be used. Limited information is available about the role of screening cardiac stress tests or echocardiography in patients with acromegaly. With lowering of GH concentrations, left ventricular size and function may improve.

Hypertension and diabetes mellitus, if present, may improve with lowering of GH and IGF-I levels. Standard dietary strategies and medical therapies for hypertension, diabetes mellitus, and hyperlipidemia should be used. In the absence of definitive interventional studies in this patient population, it seems prudent to attempt to achieve the goals for high-risk cardiac patients: blood pressure, less than 130/80 mm Hg; hemoglobin A1c, less than 6.5%; low-density lipoprotein cholesterol, less than 100 mg/dL; triglycerides, less than 150 mg/dL; and high-density lipoprotein cholesterol, more than 40 mg/dL.

### Cancer

Colon cancer develops from malignant transformation of benign colon polyps—a process believed to involve from 5 to 10 years. Early detection and treatment of colon cancer improve survival, and the removal of premalignant polyps will prevent the development of colon cancer.

Although data regarding the risk of benign or malignant colon lesions in patients with acromegaly are conflicting, the risk of death from colon cancer is increased in patients with acromegaly in whom colon cancer develops. The onset of GH hypersecretion is difficult to ascertain; it usually precedes a diagnosis of acromegaly by many years. Therefore, it is prudent to screen patients for colorectal cancer and polyps with colonoscopy at the time of diagnosis of acromegaly and then follow the American Cancer Society guidelines for patients with increased risk (colonoscopy every 5 years if no cancer or polyps are detected, with more frequent follow-up if any lesions are detected, depending on the number, size, and histologic features of the lesions).

Screening for other cancers should follow the standard guidelines established by national organizations. Because patients with acromegaly may receive treatments

that, in and of themselves, alter the risk for cancers (such as hormone replacement therapy and breast cancer, testosterone replacement and prostate cancer, and cranial irradiation and intracranial neoplasms), the screening guidelines should be adjusted accordingly.

### CLINICAL ALGORITHM(S)

None provided

## EVIDENCE SUPPORTING THE RECOMMENDATIONS

### TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is not specifically stated for each recommendation. Most of the content is based on literature reviews. In areas of uncertainty, professional judgment was applied.

## BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

### POTENTIAL BENEFITS

Recent studies have shown that many consequences related to soft tissue overgrowth can be reversed, at least in part, with appropriate therapy. In addition, appropriate therapy seems to reverse the apparent increased risk of mortality in patients with acromegaly.

#### Biochemical Control of Comorbidities

Biochemical control can lead to reversal of the associated comorbidities. Control of growth hormone (GH) and insulin-like growth factor-I (IGF-I) hypersecretion appears to reverse the risk of premature mortality.

#### Advantages of Surgical Treatment

Effective surgical intervention produces an immediate lowering of growth hormone (GH) levels and offers a potential "cure." For those patients in whom a remission is not possible because the tumor is invasive or involves a site too dangerous to approach in a radical fashion, surgical treatment decreases the tumor burden, which may lead to more successful adjunctive use of radiation therapy, pharmacologic therapy, or a combination of both. A major advantage with the option of surgical management is that one can obtain tissue and characterize the tumor by using immunocytochemistry, ultrastructural analysis, and other techniques of molecular neuropathology.

### POTENTIAL HARMS

#### Disadvantages of Surgical Treatment

Clearly, some disadvantages are associated with use of a surgical approach to acromegaly. Risks accompany all types of treatment, but with a surgical

procedure, the patient has the risks of general anesthesia, potential damage to vital structures in the brain and to the blood supply to the brain, and the possibility of vision problems, spinal fluid leak, or meningitis. Even in patients who do not have major complications, there is still the possibility of post-operative pituitary insufficiency, which occurs in about 3% of patients treated surgically.

### Potential Complications of Pituitary Radiation Therapy

The most common complication is loss of normal pituitary function, necessitating hormone replacement. With long-term follow-up, loss of pituitary function has been noted in up to 100% of patients given conventional radiation therapy. Gamma knife radiosurgery resulted in new hormone deficiency in 18 of 64 patients (28%). Less common complications of all types of pituitary irradiation include loss of vision, radiation necrosis, and development of a secondary malignant lesion in the radiation field.

### Side Effects of Medications

- Dopamine agonist (Cabergoline): nausea, gastrointestinal cramps, and headache
- Somatostatin analogues: nausea, gastrointestinal cramps, and gallstones
- Growth hormone (GH) antagonist (Pegvisomant): headache, fatigue, and abnormal liver enzymes

## CONTRAINDICATIONS

### CONTRAINDICATIONS

Contraindications to surgical treatment include:

- Patients with medically unstable conditions
- Those at high risk for complications of anesthesia because of airway difficulties
- Those with major systemic manifestations of acromegaly, including cardiomyopathy, severe hypertension, and uncontrolled diabetes

## QUALIFYING STATEMENTS

### QUALIFYING STATEMENTS

These guidelines are a working document that reflects the state of the field at the time of publication. Because rapid changes in this area are expected, periodic revisions are inevitable. Guideline developers encourage medical professionals to use this information in conjunction with their best clinical judgment. The presented recommendations may not be appropriate in all situations. Any decision by practitioners to apply these guidelines must be made in light of local resources and individual patient circumstances.

## IMPLEMENTATION OF THE GUIDELINE

### DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

## INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

### IOM CARE NEED

Living with Illness

### IOM DOMAIN

Effectiveness

## IDENTIFYING INFORMATION AND AVAILABILITY

### BIBLIOGRAPHIC SOURCE(S)

Cook DM. AACE medical guidelines for clinical practice for the diagnosis and treatment of acromegaly. Endocr Pract 2004 May-Jun;10(3):213-25. [73 references] PubMed

### ADAPTATION

Not applicable: The guideline was not adapted from another source.

### DATE RELEASED

2004 May/June

### GUIDELINE DEVELOPER(S)

American Association of Clinical Endocrinologists - Medical Specialty Society
American College of Endocrinology - Medical Specialty Society

### SOURCE(S) OF FUNDING

American Association of Clinical Endocrinologists (AACE)

### GUIDELINE COMMITTEE

AACE Acromegaly Guidelines Task Force

### COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

Task Force Members: David M. Cook, MD (Chairman); Shereen Ezzat, MD; Laurence Katznelson, MD; David L. Kleinberg, MD; Edward R. Laws, Jr., MD; Todd B. Nippoldt, MD, FACE; Brooke Swearingen, MD; Mary Lee Vance, MD

## FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

## GUIDELINE STATUS

This is the current release of the guideline.

## GUIDELINE AVAILABILITY

Electronic copies: Available in Portable Document Format (PDF) from the American Association of Clinical Endocrinologists (AACE) Web site.

Print copies: Available from the American Association of Clinical Endocrinologists (AACE), 1000 Riverside Avenue, Suite 205, Jacksonville, FL 32204.

## AVAILABILITY OF COMPANION DOCUMENTS

The following is available:

- American Asssociation of Clinical Endocrinologists protocol for standardized production of clinical practice guidelines. Endocrine Pract 2004 Jul/Aug; 10(4):353-61.

Electronic copies: Available in Portable Document Format (PDF) from the American Association of Clinical Endocrinologists (AACE) Web site.

Print copies: Available from the American Association of Clinical Endocrinologists (AACE), 1000 Riverside Avenue, Suite 205, Jacksonville, FL 32204.

## PATIENT RESOURCES

None available

## NGC STATUS

This NGC summary was completed by ECRI on September 15, 2004. The information was verified by the guideline developer on October 1, 2004.

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